CLAIMS:

1. A method of analyzing cells, comprising:

a. providing a plurality of digitized images of at least one cell of regions of unknown nuclear or cytoplasmic material, each digitized image being formed from an optical image having a plurality of pixels associated therewith, each digitized image being formed in a narrow band of optical wavelength different from the other digitized images, each of the plurality of pixels having values from each of the digitized images; and

b. analyzing the values for each pixel to identify nuclear and cytoplasmic material of the at least one cell of unknown regions of nuclear or cytoplasmic material, said analyzing step utilizing previously developed classification information for discriminating nuclear or cytoplasmic material, the previously developed classification information being developed from at least one cell of known regions of nuclear or cytoplasmic material.

2. The method of claim 1, wherein the step of analyzing the values for each pixel includes utilizing a classifier trained on a training set of data developed from images having known regions of nuclear and cytoplasmic material.

3. The method of claim 1, wherein the previously developed classification information includes values for pixels stored in a look-up table in a memory storage device.

4. The method of claim 3, wherein the previously developed classification information has memory addresses in the look-up table, the memory addresses comprising a concatenation of the values from each of the digitized images representing the same region of the at least one cell, each of the digitized images being drawn from the band of optical wavelength.

5. The method of claim 1 wherein the previously developed classification information includes a predetermined discriminant between values for pixels representing regions of nuclear and cytoplasmic material.

6. The method of claim 1, further comprising the step of assigning a classification to each pixel as representing nuclear or cytoplasmic material.

7. The method of claim 6, further comprising:

a. forming an absorption map from each of the digitized images to represent the light absorption characteristics associated with each value for each pixel before the step of analyzing; and

b. assigning a classification to each pixel based upon absorption characteristics.

8. The method of claim 7, wherein the step of forming an absorption map comprises applying a formula to each of the digitized images.

9. The method of claim 5, wherein the step of analyzing includes applying a linear discriminant analysis to define a linear boundary between values for pixels representing regions of nuclear and cytoplasmic material.

10. The method of claim 9, wherein the linear discriminant analysis discriminates between pixels of nuclear material and at least two types of cytoplasmic material.

11. The method of claim 1, wherein the at least one cell of unknown nuclear or cytoplasmic material comprises a cellular sample prepared according to the Papanicolaou staining procedure.

12. The method of claim 1, further comprising developing the previously developed classification information by:

a. providing a plurality of digitized images of at least one cell of regions of known nuclear or cytoplasmic material, each digitized image being formed from an optical

image having a plurality of pixels associated therewith, each digitized image being formed in a narrow band of optical wavelength different from the other digitized images, each of the plurality of pixels having values from each of the digitized images; and

b. assigning a classification to each pixel as representing regions of nuclear or cytoplasmic material; and

c. storing the classifications in a look-up table in a memory storage device.

13. The method of claim 12, wherein the step of storing includes storing the classifications in locations of the look-up table, the locations having addresses corresponding to the pixels.

14. The method of claim 1, wherein the step of analyzing comprises neural network processing of the values for pixels of the digitized images.

15. The method of claim 14, wherein the neural network processing comprises accepting one or more inputs into at least one processing element, multiplying the inputs by weighing factors, and applying a formula to the weighed inputs to provide an output to a plurality of other processing elements.

16. The method of claim 15, wherein each value for a pixel is accepted and processed by a different one of the at least one processing elements.

17. A method of analyzing cells, comprising:

a. providing a plurality of digitized images of at least one cell, each digitized image being formed in a narrow band of optical wavelength different from the other digitized images and including at least one first digitized image in a wavelength of between 525 to 575 nanometers, at least one second digitized image in a wavelength of between 565 to 582 nanometers, and at least one third digitized image in a wavelength of between 625 to 635 nanometers; and

b. analyzing the digitized images to identify nuclear and cytoplasmic material of the at least one cell.

18. The method of claim 17, wherein the at least one first digitized image has a wavelength of between 525 to 535 nanometers, the at least one second digitized image has a wavelength of between 572 to 582 nanometers, and the at least one third digitized image has a wavelength of between 625 to 635 nanometers.

19. The method of claim 17, wherein the at least one first digitized image has a wavelength of between 535 to 545 nanometers, the at least one second digitized image has a wavelength of between 572 to 582 nanometers, and the at least one third digitized image has a wavelength of between 625 to 635 nanometers.

20. The method of claim 17, wherein the at least one first digitized image has a wavelength of between 565 to 575 nanometers, the at least one second digitized image has a wavelength of between 565 to 575 nanometers, and the at least one third digitized image has a wavelength of between 625 to 635 nanometers.

21. The method of claim 17, wherein the step of analyzing the pixels includes utilizing a classifier trained on a set of data developed from images having known regions of nuclear and cytoplasmic material.

22. The method of claim 17, wherein the step of analyzing includes analyzing the digitized images based upon previously developed classification information.

23. The method of claim 22, wherein the step of analyzing comprises analyzing values for each pixel, each pixel having values from each of the digitized images.

24. The method of claim 17, further comprising the step of assigning a classification to each pixel as representing regions of nuclear or cytoplasmic material.

25. The method of claim 17, wherein the at least one cell comprises a cellular sample prepared according to the Papanicolaou staining procedure.

26. The method of claim 22, wherein the previously developed classification information is developed from at least one cell of known regions of nuclear or cytoplasmic material for analyzing cells of unknown regions of nuclear or cytoplasmic material.

27. The method of claim 26, further comprising the step of storing the previously developed classification information in a look-up table in an electronic memory device.

28. The method of claim 17, wherein the step of analyzing comprises neural network processing of the digitized images.